CMake and friends

...more than just a buildsystem

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CMake and friends (http://www.cmake.org)

- **CMake**: configuring and building
- **CTest & Dart**: testing and continuous integration
- **CPack**: packaging
- BSD license, developed by Kitware (http://www.kitware.com)
- Portable: Linux, Mac OS X, *BSD, MS Windows, Solaris, QNX, BeOS, AIX, HP-UX, IRIX
- only requirement: C++ compiler
CMake

- Cross platform buildsystem
- Creates Makefiles (e.g. GNU, Borland, MS, ...) and project files for KDevelop3, XCode, MS Visual Studio >= 6
- supports C, C++, Fortran, Java
- simple scripting language
- replaces autoconf, autoheader, automake, libtool, sh, m4
- Used e.g. by KDE 4, OpenWengo, ITK, VTK, Chicken Scheme, Boson, Scribus, libgphoto, PIPlot, Debian cdrecord, Rosegarden and others
CMake: Building Software

- supports executables, static and shared libraries
- cares for platform specific issues
- in- and out-of-source
- complete dependencies
- advanced RPATH handling
- install rules

```cmake
set(fooSrcs process.c foo.c)
add_library(foo SHARED ${fooSrcs})
add_executable(hello main.cpp)
target_link_libraries(hello foo)
install(TARGETS foo DESTINATION lib )
```
CMake: Configuring software

- handling of system specific properties before building
- condition statements
- `find_package(<name>)`
- check for headers, functions etc.
- creating config-headers
- execution of programs, regexps, etc.

```cmake
if(WIN32)
    add_definitions(-D_USE_WIN32_HELPERS)
endif(WIN32)
find_package(PNG REQUIRED)
include_directories(${PNG_INCLUDE_DIR})
check_include_files(malloc.h HAVE_MALLOC_H)
configure_file(config.h.in ${CMAKE_BINARY_DIR}/config.h)
```
CMake: Usage

$ mkdir build
$ cd build
$ cmake .. -GKDevelop3
$ kdevelop foo.project &
If it's not tested, it doesn't work!

- Unit testing
- Continuous and Nightly Builds: central Dart server, decentralized builds on all platforms

```cpp
enable_testing()
add_executable(foo)
add_test(foo)
```

$ make Experimental
## Build Log line 11

File: Source/kwsy/RegularExpression.cxx Line: 633

```cpp
.../CMake/Source/kwsy/RegularExpression.cxx: In function 'char* cmsys::regatom(int*)':
.../CMake/Source/kwsy/RegularExpression.cxx:633: warning: use of old-style cast
```

### 4 Files Changed by 2 Authors as of 2007-02-10 01:00 GMT

#### Nightly Builds

<table>
<thead>
<tr>
<th>Site</th>
<th>Build Name</th>
<th>Update</th>
<th>Cfg</th>
<th>Build Error</th>
<th>Build Warn</th>
<th>Build Min</th>
<th>Test NotRun</th>
<th>Test Fail</th>
<th>Test Pass</th>
<th>Test NA</th>
<th>Test Min</th>
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</thead>
<tbody>
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<td>21</td>
<td>15</td>
<td>3.4</td>
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</tbody>
</table>

Files changed: r36n11.pbm.ihost.com -- AIX53-x1C as of Feb 10 2007 01:00 GMT

- Updated files (4)
- Source (4)

**cmCommandArgumentParserHelper.cxx** Rev: 1.18 by hoffman
ENH: add atomyonly support to cmCommandArgumentParserHelper.cxx

**cmCommandArgumentParserHelper.h** Rev: 1.10 by hoffman
ENH: add atomyonly support to cmCommandArgumentParserHelper.cxx
Creating source and binary packages:
- tar.gz/bz2/Z packages
- cygwin packages
- MS Windows: Nullsoft installer files
- Mac OS X: Package Maker packages

```cpp
project(Scribus)
add_executable(scribus main.cpp)
install(TARGETS scribus DESTINATION bin)
include(CPack)

$ make package
```
The Future

- built-in support for cross-compiling
- creating library frameworks on OS X
- more project generators, e.g. Eclipse, CodeBlocks, Anjuta
- more package generators: RPM, Debian
- improved GUI instead of ccmake
- more languages: OCaml, Assembler ... ?
End

- [http://www.cmake.org](http://www.cmake.org)
- Man-Page
- Wiki
- FAQ
- Mailinglist
- Book: "Mastering CMake"